REMARKS

Pending Claims

Assuming entry of this amendment, claims 1-13 are still pending.

Changes to the Specification

The Examiner objected to the title as being not descriptive. The applicants propose the new title: "System and Method for Centralized, Automatic Extraction of Data from Remotely Transmitted Forms," which *is* descriptive.

Claim Objections

The Examiner objected to an informality in claim 9, namely, to the phrase "the transmission channel is a standard telephone line at least one of the parameters is time," which "displays incorrect grammar." The Examiner is of course correct, although the applicants have cured this defect differently from what the Examiner suggested: Rather than putting "; and" after "standard telephone line," which would have created two clauses beginning with "and," the applicants have simply added a semicolon after "standard telephone line" in line 4 of the claim.

The Examiner also suggested correcting an informality in claim 12 by inserting "in which the form" before "is generated using a conventional facsimile machine." The applicants have adopted this suggestion, but have also rearranged the claim somewhat to have a single "in which" phrase.

Claim Rejections

35 U.S.C. §102 – Shepard

The Examiner rejected claims 1, 6 and 11 as being anticipated by US 4,021,777 ("Shepard").

Claims 1 (from which claim 6 depends) and 11 have been amended to specifically recite at least two features of the invention that are lacking in Shepard, and that have clear advantages.

First, the independent claims 1 and 11 (as well as claim 10) now explicitly state that the various steps of receiving the electronic representation of the image of a sent form, and the subsequent processing of the representation, take place all in [the] central computer system. This is described throughout the specification, and is also shown in Figure 1. In large part, this makes possible the second main distinction between the invention and Shepard's system, namely, that, in the invention, the device that a sender uses to transmit a form to the central system is generated by a standard, conventional image-conversion device, such as a fax machine (see also claims 2 and 12) or scanner.

There are several advantages to this arrangement, some of which are mentioned in specification paragraphs [0019] and [0020]. The advantages can be summarized by noting that the ability to use a standard device, that is, one whose hardware or driving software need not be modified in any way to allow use of the invention, makes the invention almost universally and immediately useful since almost every modern office has at least one such standard device already.

In contrast, Shepard requires a dedicated scanning device, one whose very scanning action is controlled from the central system in response to portions of a partially received form and which even requires a dedicated control line. See, for example (emphasis added):

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Col. 1, lines 53-63
In accordance with one specific aspect of this
invention, certain functions of the scanner unit of
an optical character recognition system are
automatically controlled, in response to information
derived from characters on the document being
scanned, so as to carry out the scanning function
with optimized effectiveness. In accordance with
another specific aspect of the invention, control
information derived from the scanned document
determines the disposition to be made of the data
represented by the information characters presented
on that document

Col. 2, lines 5-14
The first eight digits of the ID Number are referred
to as the "Service Number", and identify certain
detailed instructions concerning the processing of
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the document. For example, one digit may represent the vertical distance on the document between the control character group and the first text line of information characters, *so that upon detection and decoding of that one digit, the processor can cause the scanner to skip quickly over the intervening space* and initiate scanning of the information characters without undue delay.

Col. 3, lines 44-50
The interconnecting circuitry between the scanner 10 and the central station 24 also includes *a separate return transmission line 23* for communicating in the reverse direction. *The return line 28 is used for sending to the scanner various operational commands, such as a "Read" command comprising a train of clock pulses to cause the unit to perform the scanning function.*

Col. 4, lines 46-51 (Note: Line-by-line OCR only)
When the decoder scan converter 60 has decoded and stored all of the data representing *a complete line of text* from one line buffer 26, it interrupts the computer 50 and sends a signal indicating that the decoded data is ready to be analyzed for recognition of the individual characters.

Yet another disadvantage of not using a "standard, conventional image-conversion device" is that the user of Shepard's system cannot even use normal paper and/or ink for the physical forms to be transmitted, as Col. 5, lines 31-42 make clear:

Preferably, all indicia pre-printed on the document form 100, with the exception of the control code characters, is of a color to which the scanner 10 does not respond. For example, with a particular type of red-light laser found useful in such scanning operations, the non-control indicia on the form is also of a red color. By proper selection of the red ink color, the reflected light intensity will be equal to that from the white background, i.e. the detector will be "blind" to the red printing. Thus, the scanner will respond only to the control characters and the information characters placed in the assigned spaces on the form.

35 U.S.C. §103 – Shepard and Al-Hussein

The Examiner rejected claims 2-5, 9, 12, and 13 as being obvious in view of a combination of Shepard and US 5,809,167 (Al-Hussein).

First of all, the teachings of Shepard and Al-Hussein are incompatible, since Shepard's system presupposes line-by line OCR to determine the necessary scanner control signals (see above), whereas Al-Hussein presupposes input of an entire document, or at least enough of it to allow for his segmentation processing and "Connected Component Analysis" (see Col. 21).

Moreover, Al-Hussein teaches what one might call "processing at the source" as opposed to the applicants' technique of centralized, automatic processing that is transparent to senders: Al-Hussein's system involves (Col. 5, lines 6-10, emphasis added):

> a "personal imaging computer system" [PICS], that is,
> **a single stand-alone device that contains document
> scanning, storage and processing equipment** which is
> connectable to a computerized local area network or
> wide area network.

Indeed, in the same paragraph, Al-Hussein states: "Equivalent general purpose components may be substituted for the equipment described herein," but the subsequent text makes clear that at least the specialized PICS must be available to and operable by any user of his system.

Image processing is also not transparent to the users of Al-Hussein's system, that is, processing is not automatic in that at least some of the steps listed in the applicants' claims 1, 10, and 11 as being performed automatically in the central computer system must be carried out under user direction and control. For example, in most cases, the user of Al-Hussein's system must physically go the PICS device, which combines the functions of document scanning and processing, or he must at least communicate specifically with the PICS device to direct processing by manually programming its functions. See, for example (emphasis added):

> Col. 4, lines 16-19:
> By virtue of this arrangement, operators at one of the
> workstations 40 can scan in a document using PICS
> equipment 20, segmentation-process and recognition-

process the document image so as to obtain a text file
corresponding to text areas of the document …

Col. 6, lines 48-53
[L]ikewise, it is possible for one of workstations 51
to retrieve a document image from network disk 42,
subject it to segmentation and recognition processing
on PICS equipment 20, receive and manipulate the
results at workstation 51, and print out documentation
on one of printers 56

Col. 8, lines 47-55
Consequently, when documents need to be processed by
PICS equipment 20, *a user ordinarily carries the*
documents from his workstation to PICS equipment 20.
It is considered convenient to allow the user to
program the precise document-processing functions that
will be performed by PICS equipment 20 from the user's
workstation so that those processing functions may be
carried out by PICS equipment 20 with minimal user
effort when the user is physically present at PICS
equipment 20.

Al-Hussein therefore also fails to teach a truly automated form-receiving, form-processing, and data extraction system as defined in the applicants' claims. In particular, like Shepard, Al-Hussein does not allow users to send in their documents for processing using a standard, conventional image-conversion device.

35 U.S.C. §103 – Shepard, Al-Hussein, and Earl

The Examiner rejected claim 10 as being obvious in view of a combination of Shepard, Al-Hussein, and US 5,231,663 (Earl). In particular, the Examiner cited Earl as prior art showing the matching of a received form against a template.

Again, as an initial matter, the teachings of Shepard and Earl are incompatible, since Shepard's system presupposes line-by line OCR to determine the necessary scanner control signals (see above), whereas Earl presupposes input at least enough of an entire document so his system will be able to isolate portions for "converting a bit map image into its vector components" (Col. 3, lines 31-32).

The only described embodiment of Earl's system involves matching a received document with a pre-stored, "learned" blank form, comparing entries on the received

documents with entries separately pre-stored as an "answer key" that is also "learned," and then outputting some measure of correspondence in a "score mark" process. In essence, Earl discloses a method for automatically grading a multiple-choice test where users indicate answers in pre-defined data fields. Thus, Earl is concerned not with data extraction and analysis as such, but rather simply with comparison of entries in a document with those in a "correct" key. There is no teaching in Earl as to how his system would react to receiving a form on which information is entered (such as time worked) for which there is no "correct" answer.

CONCLUSION

The applicants' invention as claimed therefore includes at least one element that is lacking in the cited references, and that provides specific advantages to users, in particular, transparency, universality, and convenience. The distinguishing features that make this possible are included in all the independent claims and are accordingly inherited by the remaining, dependent claims. Consequently, the applicants respectfully submit that the amended claims should be allowable over the cited art of record.

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Respectfully submitted,

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